Draft DCC Curation Lifecycle Model

Higgins, Sarah

Published in:
International Journal of Digital Curation

DOI:
10.2218/ijdc.v2i2.30

Publication date:
2007

Citation for published version (APA):
Higgins, S. (2007). Draft DCC Curation Lifecycle Model. *International Journal of Digital Curation*, *2*(2), 82-87. https://doi.org/10.2218/ijdc.v2i2.30

The International Journal of Digital Curation
Issue 2, Volume 2 | 2007

Draft DCC Curation Lifecycle Model

Sarah Higgins *,
Standards Advisor,
Digital Curation Centre, University of Edinburgh

December 2007

Summary

Lifecycle management of digital materials can help conceptualisation of the stages required to successfully curate digital material. A number of discipline specific models, and more generally applicable standards, have been developed which can be used as a basis when planning and implementing organisational management of digital material. The generic Draft DCC Curation Lifecycle Model identifies curation actions applicable either across the whole digital lifecycle or sequentially throughout it. Domain specific models, with greater granularity, will be developed to ensure readily accessible advice.

The *International Journal of Digital Curation* is an international journal committed to scholarly excellence and dedicated to the advancement of digital curation across a wide range of sectors. ISSN: 1746-8256 The IJDC is published by UKOLN at the University of Bath and is a publication of the Digital Curation Centre.

A lifecycle approach to the management of digital materials enables visualisation of the processes, activities and relationships required for successful curation and long-term preservation. A number of disciplines and projects have developed lifecycle models for digital assets, which serve as the framework for the detailed planning activities required by particular domains. Personal Digital Archives are served by the Paradigm Project's *Lifecycle for the long-term preservation of digital archives* (Paradigm Project, 2006). Institutional repositories can look to the work of the SHERPA DP Project (Knight, 2006) and the LIFE Project (Wheatley, Ayris, Davies, Mcleod, & Shenton, 2007). The InterPares *Chain of Preservation Model* (InterPARES 2 Project, 2007) provides both high-level overviews, and comprehensive granular diagrams describing the detailed processes required for electronic records management. Similar work is being undertaken in the areas of e-Science (Humphrey, 2006) and e-Research (Lyon, 2003).

Lifecycle planning for digital material can be underpinned by adherence to relevant standards and specifications. OAIS (ISO 14721:2003 *Space data and information transfer systems — Open archival information system — Reference model* (International Organization for Standardization [ISO], 2003)) provides a generic conceptual framework for building a complete archival repository. ISO 15489 parts 1 and 2 (ISO 15489: 2001 *Information and documentation. Records management* (ISO, 2001)) provide both a best practice framework and implementation guidelines for the management of both digital and physical information. The forthcoming revision of the MoReq Specification (2007) (*Model Requirements for the Management of Electronic Records Update and Extension, 2007*) considers the administrative stages required, and applicable standards to implement, when developing technical solutions for digital curation in a corporate environment.

The Draft DCC Curation Lifecycle Model (see Figure 1 below) provides a generic graphical high-level overview of the stages required for successful curation and preservation of digital material from initial conceptualisation. The model can be used to plan curation and preservation activities within an organisation or consortium to ensure that all necessary stages are undertaken, each in the correct sequence. The model enables granular functionality to be mapped against it to define roles and responsibilities, and build a framework of standards and technologies to implement. It can help with the process of identifying additional steps which may be required, or actions which are not required by certain situations or disciplines, and of ensuring that processes and policies are adequately documented.

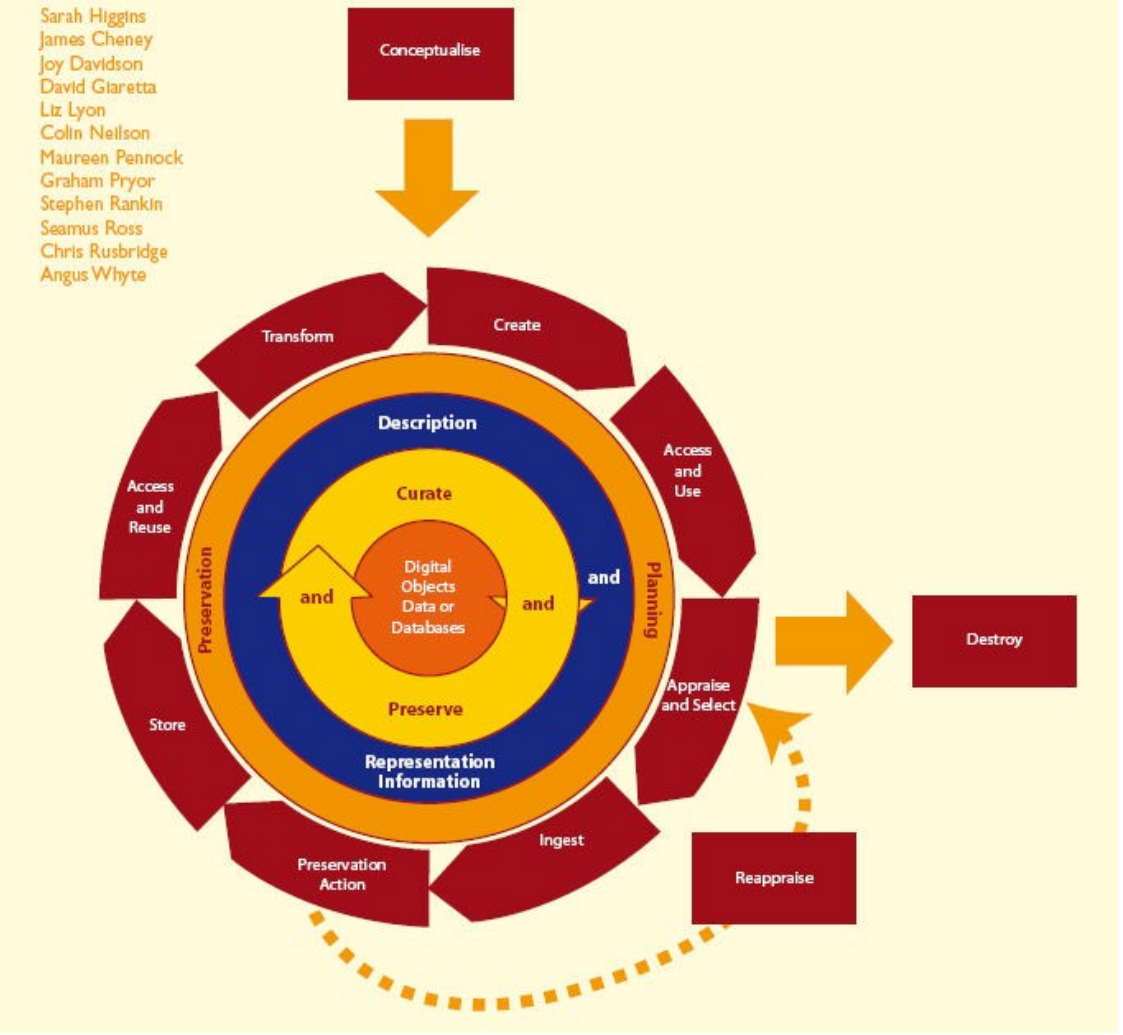

Figure 1. Draft DCC Curation Lifecycle Model.

The two tables below outline full lifecycle and sequential actions:

Full Lifecycle Actions	
Preservation Planning	Plan for preservation throughout the lifecycle of digital material.
Description and Representation Information	Assign administrative, descriptive, technical, structural and preservation metadata, using appropriate standards, to ensure adequate description and control over the long term. Collect and assign Representation Information required to understand and render both the digital material and the associated metadata.
Curate and Preserve	Be aware of, and undertake actions to promote curation and preservation throughout the lifecycle.

Sequential Actions	
Conceptualise	Conceive and plan the creation of digital material, including capture method and storage options.
Create	Create digital material including administrative, descriptive, structural and technical metadata.
Access and Use	Ensure that digital material can be actively accessed by the designated users on a day-to-day basis. This may be in the form of publicly available published information, and robust access controls and authentication procedures may be applicable.
Appraise and Select	Evaluate digital material and select for long-term curation and preservation. Adhere to documented guidance, policies or legal requirements.
Destroy	Destroy material which has not been selected for long-term curation and preservation. Documented policies, guidance or legal requirements may require that this be done securely.
Ingest	Transfer material to an archive, repository, data centre or other custodian. Adhere to documented guidance, policies or legal requirements.
Preservation Action	Undertake actions to ensure long-term preservation and retention of the authoritative nature of digital material. Preservation actions should ensure that material remains authentic, reliable and usable while maintaining its integrity. Actions include validation, assigning preservation metadata, assigning representation information and ensuring acceptable data structures or file formats.
Reappraise	Return digital material which fails validation procedures for further appraisal and reselection.
Store	Store the data in a secure manner adhering to relevant standards.
Access and Reuse	Ensure that data is accessible to both designated users and reusers. This may be in the form of publicly available published information. Robust access controls and authentication procedures may be applicable.
Transform	Create new digital material from the original, for example - by migration into a different form - by creating a subset by selection or query to create newly derived results, perhaps for publication.

The Digital Curation Centre will shortly start to use this draft model to ensure that information, services and advisory material cover all areas of the lifecycle. Domain-specific variations will be developed, with greater levels of granularity, to help ensure that advice and information are easily accessible from the website.

This draft model is now open for public consultation. We welcome comments on both the model and domain-specific variations by February 29, 2008. Such feedback can be emailed to Sarah.Higgins@ed.ac.uk or posted on the DCC Curation Lifecycle Model topic on the DCC Forum at http://forum.dcc.ac.uk

Acknowledgements

I would like to thank James Cheney, Joy Davidson, David Giaretta, Liz Lyon, Colin Neilson, Maureen Pennock, Graham Pryor, Stephen Rankin, Seamus Ross, Chris Rusbridge and Angus Whyte for their contributions to this article.

References

Paradigm Project. (2006). Workbook on Digital Private Papers Draft lifecycle for the long-term preservation of digital archives. Retrieved December 4, 2007, from http://www.paradigm.ac.uk/workbook/introduction/paradigm-lifecycle.html

Knight, G, (2006). A lifecycle model for an e-print in the institutional repository. Retrieved December 4, 2007, from http://www.sherpadp.org.uk/documents/wp213-lifecycle_model.pdf

Wheatley, P., Ayris, P., Davies, R., Mcleod, R., & Shenton, H. (2007). The LIFE model v1.1..Discussion paper. LIFE Project: London.

InterPARES 2 Project. (2007). *Chain of preservation (COP) model*. Retrieved December 4, 2007, from http://www.interpares.org/ip2/ip2_models.cfm#

Humphrey, C. (2006), e-Science and the Life Cycle of Research. Retrieved December 4, 2007, from datalib.library.ualberta.ca/~humphrey/lifecycle-science060308.doc (sic)

Lyon, L. (2003, July). eBank UK: Building the links between research data, scholarly communication and learning, *Ariadne, Issue 36*. Retrieved December 4, 2007, from http://www.ariadne.ac.uk/issue36/lyon/

ISO (International Organization for Standardization) (2003). ISO 14721:2003. Space data and information transfer systems — Open archival information system - Reference model. Retrieved December 9, 2007, from http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_detail.htm?csnumber=24683

ISO (International Organization for Standardization) (2001).ISO 15489-1:2001 Information and documentation. Records management. General and ISO/TR 15489-2:2001 Information and documentation. Records management. Guidelines. Retrieved December 9, 2007, from http://www.iso.org/iso/catalogue_detail?csnumber=31908

MoReq2 Team. (2007). Model requirements for the management of electronic records update and extension – Draft version 4.

Bibliography

Boehm, B (1988), *A Spiral Model of Software Development and Enhancement*. Retrieved December 4, 2007, from http://www.sce.carleton.ca/faculty/ajila/4106-5006/Spiral%20Model%20Boehm.pdf

Chen, Y., Chen, S., & Lin, S. (2003). A metadata lifecycle model for digital libraries: methodology and application for an evidence-based approach to library research. In *Documents in Information Science, Working Papers Series*. Retrieved December 4, 2007, from http://www.ifla.org/IV/ifla69/papers/141e-Chen_Chen_Lin.pdf

Dukes, P. (2006), *Making the most of our data: MRC's data sharing & preservation initiative.* Retrieved December 4, 2007, from http://www.rin.ac.uk/files/Peter%20Dukes%20v2.pdf

Green, A. (2006). Conceptualizing the digital life cycle. *IASSIST Communiqué*. Retrieved December 4, 2007, from http://iassistblog.org/?p=26

Lord, P., & Macdonald, A. (2003). *e-Science Curation Report: Data curation for e-Science in the UK: an audit to establish requirements for future curation and provision.* Retrieved December 4, 2007, from http://www.jisc.ac.uk/uploaded_documents/e-ScienceReportFinal.pdf

Pennock, M. (2007). Digital curation: a life-cycle approach to managing and preserving usable digital information. *Library and Archives Journal, 1.* Retrieved (pre-print) December 9, 2007, from http://www.ukoln.ac.uk/ukoln/staff/m.pennock/publications/

Royce, W. (1970). *Managing the development of large software systems.* Retrieved December 4, 2007, from http://www.cs.umd.edu/class/spring2003/cmsc838p/Process/waterfall.pdf

Rusbridge, C. (2007). *Curation mind map* (unpublished diagram)

Rusbridge, C. (2005). *Information Life Cycle and Curation.* Retrieved December 4, 2007, from http://www.dcc.ac.uk/docs/dcc-life-cycle.ppt

Upward, F. (1997). Structuring the record continuum part one: Post custodial principles and properties. *Archives and Manuscripts*, vol 24, no 2, pp 268-285.